Docket No.: P-6106/BDX0032-00US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of: SCHILLER et al.	
Application No.: 10/668,863	Group Art Unit: 3767
Filed: September 23, 2003	Examiner: MacNeill, Elizabeth
For: FLUSH SYRINGE HAVING ANTI-REFLUX FEATURES	Confirmation No.: 3151

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF ON APPEAL

Sir:

Further to the Notice of Appeal filed on October 14, 2008, for the subject application, a brief in support of the appeal is now submitted. According to the Decision mailed on November 4, 2008, regarding Applicants' Petition under the unintentional provisions of 37 § CFR 1.137(b), submission of a brief in support of the appeal in this case is due by January 4, 2009. Accordingly, this brief is being timely filed.

TABLE OF CONTENTS

Page

REAL PARTY IN INTEREST

The real party in interest is BECTON, DICKINSON AND COMPANY, the assignee of the instant application.

RELATED APPEALS AND INTERFERENCES

The undersigned is not aware of any appeals or interferences that are related to this appeal, or which will affect or have a bearing on this appeal.

STATUS OF CLAIMS

Claims 1 and 3-14 were finally rejected in an Office Action mailed on February 20, 2008 ("the Final Office Action"), and are the subject of this appeal. Claim 2 was previously cancelled.

STATUS OF AMENDMENTS

No claims have been amended, added or cancelled subsequent to the Final Office Action.

SUMMARY OF CLAIMED SUBJECT MATTER

The claimed subject matter encompasses an intravenous (I.V). flush syringe assembly and methods for its use. Independent claim 1 is directed to an I.V. flush syringe assembly comprising:

> a barrel (Figure 2, element 22) including a cylindrical sidewall (Figure 2, element 23) having an inside surface (Figure 2, element 32) defining a chamber for retaining fluid (Figure 2, element 33), an open proximal end (Figure 2, element 28) and a distal end (Figure 2, element 30) including a distal wall with an elongate tip (Figure 2, element 36) extending distally therefrom having a passageway (Figure 2, element 38) therethrough in fluid communication with said chamber; *(page 7, line 22 to page 8, line 9)*
>
> a plunger (Figure 2, element 24) including an elongate body portion (Figure 2, element 25) having a proximal end (Figure 2, element 50), a distal end (Figure 2, element 52) and a stopper (Figure 2, element 54) slidably positioned in fluid-tight engagement with said inside surface of said barrel for drawing fluid into and driving fluid out of said chamber by movement of said stopper relative to said barrel, said elongate body portion extending outwardly from said open proximal end of said barrel, said

stopper having a distal surface (Figure 2, element 58); *(page 8, lines 11-20)* and

a proximally facing annular boss (Figure 2, element 35) on said on said inside surface of said distal wall surrounding said passageway, said boss being positioned so that it contacts said distal surface of said stopper and seals said passageway before portions of said inside surface of said distal wall surrounding said boss contact said distal surface of said stopper, thereby controlling stopper deflection when fluid has been delivered from said chamber and said stopper is in contact with said distal wall. *(page 10, lines 14-24)*

Independent claim 11 is directed to an I.V. flush syringe assembly comprising:

a barrel including a cylindrical sidewall having an inside surface defining a chamber for retaining fluid, an open proximal end and a distal end including a distal wall with an elongate tip extending distally therefrom having a passageway therethrough in fluid communication with said chamber; *(page 7, line 22 to page 8, line 9)*

a plunger including an elongate body portion having a proximal end, a distal end and a stopper slidably positioned in fluid-tight engagement with said inside surface of said barrel for drawing fluid into and driving

fluid out of said chamber by movement of said stopper relative to said barrel, said elongate body portion extending outwardly from said open proximal end of said barrel, said stopper having a distal surface; *(page 8, lines 11-20)* and

a tip cap (Figure 2, element 45) releasably connected to said tip of said syringe barrel for sealing said passageway; *(page 9, lines 17-19)*

a quantity of flush solution in said chamber between said stopper and said distal wall; *(page 9, lines 16-17)*

anti-reflux means for controlling stopper deflection when fluid has been delivered from said chamber and said stopper is in contact with said distal wall, said anti-reflux means including a proximally facing annular boss on said inside surface of said of said distal wall surrounding said passageway, said boss being positioned so that it contacts said distal surface of said stopper and seals said passageway before portions of said inside surface of said distal wall surrounding said boss contact said distal surface of said stopper. *(page 10, lines 14-24)*

Independent claim 13 is directed to a method of flushing a catheter comprising:

(a) providing a syringe assembly having a barrel including a cylindrical sidewall having an inside surface defining a chamber for retaining fluid, an open proximal

end and a distal end including a distal wall with an elongate tip extending distally therefrom having a passageway therethrough in fluid communication with said chamber, a plunger including an elongate body portion having a proximal end, a distal end, and a stopper having a distal surface, said stopper being slidably positioned in fluid-tight engagement with said inside surface of said barrel for drawing fluid into and driving fluid out of said chamber by movement of said stopper relative to said barrel, said elongate body portion extending outwardly from said open proximal end of said barrel, a quantity of flush solution in said chamber, and a proximally facing annular boss on said inside surface of said distal wall surrounding said passageway; *(page 7, line 22 to page 9, line 19)*

(b) providing a catheter (Figure 7, element 70) having a proximal end, a distal end and a passageway therethrough and a housing (Figure 7, element 67) having a hollow interior (Figure 7, element 68) connected to said catheter and in fluid communication with said passageway, said housing having an access valve for allowing fluid communication with said hollow interior; *(page 9, line 25 to page 10, line 2)*

(c) placing said distal end of said catheter in a blood vessel; *(page 6, lines 6-7)*

(d) engaging said elongate tip of said barrel with said access valve so that said passageway of said syringe barrel is in fluid communication with said hollow interior of said housing; *(page 10, lines 5-7)*

(e) applying force to said plunger to move said plunger in a distal direction with respect to said barrel so that said flush solution in said chamber flows through said passageway into said hollow chamber of said housing and through said passageway of said catheter; *(page 10, lines 8-13)*

(f) contacting said distal surface of said stopper with said boss and sealing said passageway to control stopper deflection before portions of said inside surface of said distal wall surrounding said boss contact said distal surface of said stopper, *(page 10, lines 14-24)* and

(g) disengaging said elongate tip from said access valve. *(page 6, lines 14-15)*

Independent claim 14 is directed to a method of flushing a catheter comprising:

(a) providing a syringe assembly having a barrel including a cylindrical sidewall including an inside surface defining a chamber for retaining fluid, an open proximal

end and a distal end including a distal wall with an elongate tip extending distally therefrom having a passageway therethrough in fluid communication with said chamber, a plunger including an elongate body portion having a proximal end, a distal end, and a stopper having a distal surface, said stopper being slidably positioned in fluid-tight engagement with said inside surface of said barrel for drawing fluid into and driving fluid out of said chamber by movement of the stopper relative to said barrel, said elongate body portion extending outwardly from said open proximal end of said barrel, a quantity of flush solution in said chamber, a needle assembly including a cannula having a proximal end, a distal end and a lumen therethrough and a hub having an open proximal end containing a cavity and a distal end attached to said proximal end of said cannula so that said lumen is in fluid communication with said cavity, said needle assembly being attached to said tip of said barrel so that said lumen ins in fluid communication with said chamber, and a proximally facing annular boss on said inside surface of said distal wall surrounding said passageway; *(page 7, line 22 to page 9, line 19)*

(b) providing a catheter having a proximal end, a distal end and a passageway therethrough and a housing having a hollow interior connected to said catheter and in fluid communication with said passageway, said housing having a septum (Figure 7, element 69) for allowing fluid communication with said hollow interior; *(page 9, line 25 to page 10, line 2)*

(c) placing said distal end of said catheter in a blood vessel; *(page 6, lines 6-7)*

(d) forcing said distal end of said cannula through said septum so that said lumen is in fluid communication with said hollow interior of said housing; *(page 10, lines 4-7)*

(e) applying force to said plunger to move said plunger in a distal direction with respect to said barrel so that said flush solution in said chamber flows through said passageway into said hollow chamber of said housing and through said passageway of said catheter; *(page 10, lines 8-13)*

(f) contacting said distal surface of said stopper with said boss and sealing said passageway to control stopper deflection before portions of said inside surface of said

distal wall surrounding said boss contact said distal surface of said stopper; *(page 10, lines 14-24)* and

(g) withdrawing said cannula from said septum.

(page 7, lines 1-2)

The dependent claims are directed to various embodiments of the disclosed method. In particular, claim 5 is directed to the I.V. flush syringe of claim 1 further including at least one projection (Figure 4, element 60) on the distal surface of the stopper positioned mostly in a space between the distal surface and the inside surface of the distal wall when the distal surface of the stopper first contacts the annular boss. *(page 10, line 24 to page 11, line 3)*

Similarly, claim 12 is directed to the syringe assembly of claim 11 further including at least one projection on the distal surface of the stopper positioned mostly in a space between the distal surface and the inside surface of the distal wall when the distal surface of the stopper first contacts the annular boss. *(page 10, line 24 to page 11, line 3)*

A copy of the appealed claims is appended hereto, beginning at page 24.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

I. Whether claims 1, 3-5, 9 and 10 are anticipated under 35 U.S.C. § 102(e) by Chen (US 7,104,970; "Chen").

II. Whether claims 6-8 and 11-14 are unpatentable under 35 U.S.C. § 103(a) over Chen in view of Ward (US 2004/0127859; "Ward").

ARGUMENT

I. Rejection Under 35 U.S.C. § 102

Claims 1, 3-5, 9 and 10 stand finally rejected under 35 U.S.C. § 102(e) as allegedly anticipated by Chen. According to the Examiner in the Final Office Action, Chen teaches a barrel (10) with a tip (12), plunger (50) with a stopper (70) and a proximally facing annular boss (22) (citing Figure 3).

It has long been the law that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art reference. *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 638, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted). In addition, for an anticipation rejection to be proper, the reference must clearly and unequivocally disclose the claimed subject matter or direct those skilled in the art to the claimed subject matter without any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference. *See In re Arkley*, 455 F.2d 586, 587 (CCPA 1972); *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1334 (Fed. Cir. 2008) ("But disclosure of each element is not quite enough – this court has long held that '[a]nticipation requires the presence in a single prior art disclosure of all elements of a

claimed invention *arranged as in the claim.*'") (quoting *Connell v. Sears, Roebuck & Co.,* 722 F.2d 1542, 1548 (Fed. Cir. 1983) (emphasis in original).

Claim 1 (and thus claims 3-5, 9 and 10) is directed to an I.V. flush syringe comprising, *inter alia*, a barrel having a passageway, a plunger having a stopper, and a ***proximally facing annular boss*** on the interior of the distal wall of the barrel ***surrounding the passageway*** and positioned so that it contacts the distal surface of the stopper and ***seals the passageway*** of the barrel before the stopper contacts the distal wall of the barrel, thereby controlling stopper deflection when fluid has been delivered from the barrel and the stopper is in contact with the distal wall of the barrel. Applicants have found that such a configuration controls stopper compression and prevents reflux of blood into the barrel following flushing. *See* page 10, lines 14-22; Figure 6.

In contrast to the claimed I.V. flush syringe, the syringe disclosed in Chen does not contain a proximally facing annular boss surrounding the passageway of a barrel. Rather, element 22, relied upon by the Examiner, is shown in Figure 2 extending from the distal barrel wall only two points. Indeed, claim 1 specifically recites that the syringe comprises "at least one piercing element formed on an inner wall" of the barrel, indicating that multiple piercing elements located at distinct points on the inner wall of the barrel is contemplated. The Examiner contends that the instant claims do not require that the annular boss "completely surround" the passageway, and that element 22 therefore meets the limitation. However, this interpretation is contrary to the plain meaning of "surround," which is to enclose on all sides simultaneously or encircle. *See* "surround." *Merriam-Webster Online Dictionary*, 2008, Merriam-Webster Online, 10 October 2008, <http://www.merriam-webster.com/dictionary/surround>. This is

consistent with the boss' function in the instant application, which is to seal the passageway. This can only be accomplished if the boss encircles the passageway. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) ("'The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct.'") (quoting *Renishaw PLC v. Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)).

Element 22 of Chen is not capable of performing this function of sealing the passageway. Element 22 is described as a "piercing element" whose function is to pierce stopper 70, causing flukes 62,64 to couple with bulge loop 34 shown in Figure 6. *See* col. 2, line 66 to col. 3, line 2. This piercing of stopper 70 produces a hole 76 which prevents use of barrel 10 because "it is broken and will ***leak***." *See* Col. 3, lines 5-6 (emphasis added). A leaking hole in stopper 70 cannot be said to "seal the passageway" of the barrel, as required by the instant claims.

According to the Examiner, the seal is broken in Figure 6 of Chen only when the plunger is withdrawn, not when the plunger is in contact with piercing element 22. However, the Examiner ignores the further claim requirement that when the annular boss seals the passageway of the barrel, it also ***controls stopper deflection*** when fluid has been delivered from the barrel and the stopper is in contact with the distal wall of the barrel. The Examiner has not provided any evidence or reasoning tending to show that piercing element 22 is capable of performing this function. Indeed, as shown in Figure 6 of Chen, one would expect piercing element 22 to be incapable of performing this function, since piercing the stopper creates a hole which allows it to contact to interior distal wall of the barrel, leading to compression of the stopper and undesired reflux.

Since piercing element 22 has not been shown to be capable of performing the positively recited function controlling stopper deflection, Chen cannot anticipate the instant claims. *See Acromed Corp. v. Sofamor Danek Group*, 253 F.3d 1371, 1383-84 (Fed Cir. 2001) ("To anticipate, the Konstantinou patent must disclose, either directly or inherently, a body portion and a tapered shoulder that project into the bone opening, restrict movement of the bone screw, and block effluence. Konstantinou does not disclose these functions. Danek, therefore, had the burden of putting forth evidence that made 'clear that the missing descriptive matter is necessarily present in the . . . reference.' . . . While the long shank in the Konstantinou screw may serve as a body portion, this shank directly abuts the rounded head portion without a tapering shoulder . . . . Furthermore, the record does not show that the rounded head of the Konstantinou screw could act as a shoulder to necessarily project into the bone opening or play any role in restricting screw movement or blocking effluence.") (citations omitted).

Accordingly, Appellants maintain that claims 1, 3-5, 9 and 10 are not anticipated by Chen, and respectfully request that the rejection be reversed.

Claim 5

With specific reference to claim 5, which depends from claim 1, Appellants note that the syringe assembly of claim 5 further includes at least one projection on the distal surface of the stopper positioned in a space between the distal surface of the stopper and the inside surface of the distal wall of the barrel when the distal surface of the stopper first contacts said annular boss. Such a projection is shown as element 60 in Figure 4 of the instant application. Projection 60 is shaped such that upon deflection of the stopper

upon contact with the annular boss, the projection cannot create enough force to move the stopper proximally to create reflux. *See* page 10, lines 24-28. This is shown in Figure 6.

The Examiner has pointed to nothing in Chen that shows that the disclosed piston has a projection on its distal surface positioned in a space between the distal surface of the stopper and the inside surface of the distal wall of the barrel that prevents proximal movement of the barrel following ejection of fluid from the barrel. Indeed, Figure 6 of Chen clearly shows that piston 70 lacks any material at the recited position. Although Figure 6 does show flukes 62,64 projecting proximally towards the needle, Figure 1 makes clear that these flukes project from the top of plunger 50, not piston 70. Furthermore, the flukes are not positioned between the distal surface of the plunger and the inside surface of the distal wall of the barrel following ejection of fluid, but rather in barrel extension 12 where they couple with bulge loop 34 on needle seat 30, as shown in Figure 6. As such, in contrast to the claimed stopper projection, the flukes of Chen cannot function to prevent proximal movement of the barrel following ejection of fluid from the barrel. Indeed, as shown in Figures 7 and 8, the entire purpose of the flukes is to grab and disarm the needle seat when the plunger is displaced in a ***proximal direction*** following use. *See* col. 2, line 66 to col. 3, line 11.

Accordingly, Appellants submit that claim 5 is not anticipated by Chen separate and apart from the reasons given above for claim 1, and respectfully request that the rejection be reversed.

II. Rejection Under 35 U.S.C. § 103

Claims 6-8 and 11-14 stand finally rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Chen in view of Ward. According to the Examiner in the Final Office

Action, Chen teaches the syringe as above but does not teach a method of flushing a catheter. The Examiner asserts, however, that Ward teaches a method of flushing a catheter with flush solution and a syringe with a tip cap. Therefore, according to the Examiner, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the syringe of Chen as an alternate anti-reflux syringe with the method of Ward in order to prevent reuse and contamination of the syringe.

Claims 6 to 8 depend from claim 1. Claims 11-14, like claim 1, recite a proximally facing annular boss surrounding the barrel passageway for controlling stopper deflection. As discussed above with respect to the anticipation rejection of claim 1, Chen does not disclose such a proximally facing annular boss, but rather a piercing element extending at specific points into the barrel which punctures the stopper, rendering it unreusable. The Examiner has not pointed to anything in Ward that remedies this deficiency. As such, the combination of Chen with Ward cannot render the claimed invention obvious. *See In re Rijckaert*, 9 F.3d 1531, 1533 (Fed Cir. 1993) ("Awamoto does not disclose the wrapping angle of the record carrier around the head drum or the number of times that a head pair which comes in contact with the record carrier does not record a signal on the record carrier. Nor does Awamoto discuss the claimed relationship of the three variables to time expansion/compression. Driessen, the secondary reference, is relied upon only to teach the provision of a pair of write heads having a mechanically rigid coupling to each other and does not remedy the deficiencies of Awamoto. Thus, the prior art relied upon does not disclose, suggest, or render obvious the claimed invention, either individually or when combined.").

Accordingly, Appellants maintain that claims 6-8 and 11-14 are not unpatentable over Chen in view of Ward, and respectfully request that the rejection be reversed.

Claim 12

With specific reference to claim 12, which depends from claim 11, Appellants note that the syringe assembly of claim 12 further includes at least one projection on the distal surface of the stopper positioned in a space between the distal surface of the stopper and the inside surface of the distal wall of the barrel when the distal surface of the stopper first contacts said annular boss.

As discussed above with respect to anticipation rejection of claim 5, the Examiner has pointed to nothing in Chen that shows that the disclosed piston has a projection on its distal surface positioned in a space between the distal surface of the stopper and the inside surface of the distal wall of the barrel that prevents proximal movement of the barrel following ejection of fluid from the barrel. Likewise, the Examiner has pointed to nothing in Ward that discloses the claimed projection.

Accordingly, Appellants submit that claim 5 is not unpatentable over Chen in view of Ward separate and apart from the reasons given above for claim 11, and respectfully request that the rejection be reversed.

CONCLUSION

For the foregoing reasons, Applicants maintain that claims 1 and 3-14 meet the requirements for patentability under 35 U.S.C. §§ 102 and 103. Accordingly, reversal of the Examiner's rejections is appropriate and is respectfully solicited.

Respectfully submitted,

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December 22, 2008

CLAIMS APPENDIX

1. An I.V. flush syringe assembly comprising:

a barrel including a cylindrical sidewall having an inside surface defining a chamber for retaining fluid, an open proximal end and a distal end including a distal wall with an elongate tip extending distally therefrom having a passageway therethrough in fluid communication with said chamber;

a plunger including an elongate body portion having a proximal end, a distal end and a stopper slidably positioned in fluid-tight engagement with said inside surface of said barrel for drawing fluid into and driving fluid out of said chamber by movement of said stopper relative to said barrel, said elongate body portion extending outwardly from said open proximal end of said barrel, said stopper having a distal surface; and

a proximally facing annular boss on said inside surface of said distal wall surrounding said passageway, said boss being positioned so that it contacts said distal surface of said stopper and seals said passageway before portions of said inside surface of said distal wall surrounding said boss contact said distal surface of said stopper, thereby controlling stopper deflection when fluid has been delivered from said chamber and said stopper is in contact with said distal wall.

3. The syringe assembly of claim 1 wherein said inside surface of said distal wall is conically shaped and said annular boss is raised from said inside surface.

4. The syringe assembly of claim 1 wherein said distal surface of said stopper being conically shaped and projecting toward said annular boss.

5. The syringe assembly of claim 1 further including at least one projection on said distal surface of said stopper positioned mostly in a space between said distal surface and said inside surface of said distal wall when said distal surface of said stopper first contacts said annular boss.

6. The syringe assembly of claim 1 including flush solution in said chamber.

7. The syringe assembly of claim 6 further including a tip cap releasably connected to said tip of said syringe barrel for sealing said passageway.

8. The syringe assembly of claim 6 wherein said flush solution is selected from the group consisting of saline flush solution and heparin lock flush solution.

9. The syringe assembly of claim 1 wherein said stopper is made of material selected from the list consisting of thermoplastic elastomers, natural rubber, synthetic rubber, thermoplastic materials and combinations thereof.

10. The syringe assembly of claim 1 further comprising a needle assembly including a cannula having a proximal end, a distal end and a lumen therethrough, and a hub having an open proximal end containing a cavity and a distal end attached to said proximal end of said cannula so that said lumen is in fluid communication with said cavity, said needle assembly being removably attached to said tip of said barrel through engagement of said

tip to said cavity so that said lumen is in fluid communication with said chamber.

11. An I.V. flush syringe assembly comprising:

a barrel including a cylindrical sidewall having an inside surface defining a chamber for retaining fluid, an open proximal end and a distal end including a distal wall with an elongate tip extending distally therefrom having a passageway therethrough in fluid communication with said chamber;

a plunger including an elongate body portion having a proximal end, a distal end and a stopper slidably positioned in fluid-tight engagement with said inside surface of said barrel for drawing fluid into and driving fluid out of said chamber by movement of said stopper relative to said barrel, said elongate body portion extending outwardly from said open proximal end of said barrel, said stopper having a distal surface; and

a tip cap releasably connected to said tip of said syringe barrel for sealing said passageway;

a quantity of flush solution in said chamber between said stopper and said distal wall;

anti-reflux means for controlling stopper deflection when fluid has been delivered from said chamber and said stopper is in contact with said distal wall, said anti-reflux means including a proximally facing annular boss on said inside surface of said of said distal wall surrounding said passageway, said boss being positioned so that it contacts said distal surface of said stopper and seals said passageway before portions of said inside surface of said distal wall surrounding said boss contact said distal surface of said stopper.

12. The syringe assembly of claim 11 further including at least one projection on said distal surface of said stopper positioned mostly in a space between said distal surface and said inside surface of said distal wall when said distal surface of said stopper first contacts said annular boss.

13. A method of flushing a catheter comprising the steps of:

(a) providing a syringe assembly having a barrel including a cylindrical sidewall having an inside surface defining a chamber for retaining fluid, an open proximal end and a distal end including a distal wall with an elongate tip extending distally therefrom having a passageway therethrough in fluid communication with said chamber, a plunger including an elongate body portion having a proximal end, a distal end, and a stopper having a distal surface, said stopper being slidably positioned in fluid-tight engagement with said inside surface of said barrel for drawing fluid into and driving fluid out of said chamber by movement of said stopper relative to said barrel, said elongate body portion extending outwardly from said open proximal end of said barrel, a quantity of flush solution in said chamber, and a proximally facing annular boss on said inside surface of said distal wall surrounding said passageway;

(b) providing a catheter having a proximal end, a distal end and a passageway therethrough and a housing having a hollow interior connected to said catheter and in fluid communication with said passageway, said housing having an access valve for allowing fluid communication with said hollow interior;

(c) placing said distal end of said catheter in a blood vessel;

(d) engaging said elongate tip of said barrel with said access valve so that said passageway of said syringe barrel is in fluid communication with said hollow interior of said housing;

(e) applying force to said plunger to move said plunger in a distal direction with respect to said barrel so that said flush solution in said chamber flows through said passageway into said hollow chamber of said housing and through said passageway of said catheter;

(f) contacting said distal surface of said stopper with said boss and sealing said passageway to control stopper deflection before portions of said inside surface of said distal wall surrounding said boss contact said distal surface of said stopper, and

(g) disengaging said elongate tip from said access valve.

14. A method of flushing a catheter comprising the steps of:

(a) providing a syringe assembly having a barrel including a cylindrical sidewall including an inside surface defining a chamber for retaining fluid, an open proximal end and a distal end including a distal wall with an elongate tip extending distally therefrom having a passageway therethrough in fluid communication with said chamber, a plunger including an elongate body portion having a proximal end, a distal end, and a stopper having a distal surface, said stopper being slidably positioned in fluid-tight engagement with said inside surface of said barrel for drawing fluid into and driving fluid out of said chamber by movement of the stopper relative to said barrel, said elongate body portion extending outwardly from said open proximal end of said barrel, a quantity of flush solution in said chamber, a needle assembly including a cannula having a proximal end, a

distal end and a lumen therethrough and a hub having an open proximal end containing a cavity and a distal end attached to said proximal end of said cannula so that said lumen is in fluid communication with said cavity, said needle assembly being attached to said tip of said barrel so that said lumen ins in fluid communication with said chamber, and a proximally facing annular boss on said inside surface of said distal wall surrounding said passageway;

(b) providing a catheter having a proximal end, a distal end and a passageway therethrough and a housing having a hollow interior connected to said catheter and in fluid communication with said passageway, said housing having a septum for allowing fluid communication with said hollow interior;

(c) placing said distal end of said catheter in a blood vessel;

(d) forcing said distal end of said cannula through said septum so that said lumen is in fluid communication with said hollow interior of said housing;

(e) applying force to said plunger to move said plunger in a distal direction with respect to said barrel so that said flush solution in said chamber flows through said passageway into said hollow chamber of said housing and through said passageway of said catheter;

(f) contacting said distal surface of said stopper with said boss and sealing said passageway to control stopper deflection before portions of said inside surface of said distal wall surrounding said boss contact said distal surface of said stopper; and

(g) withdrawing said cannula from said septum.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.